SAMS

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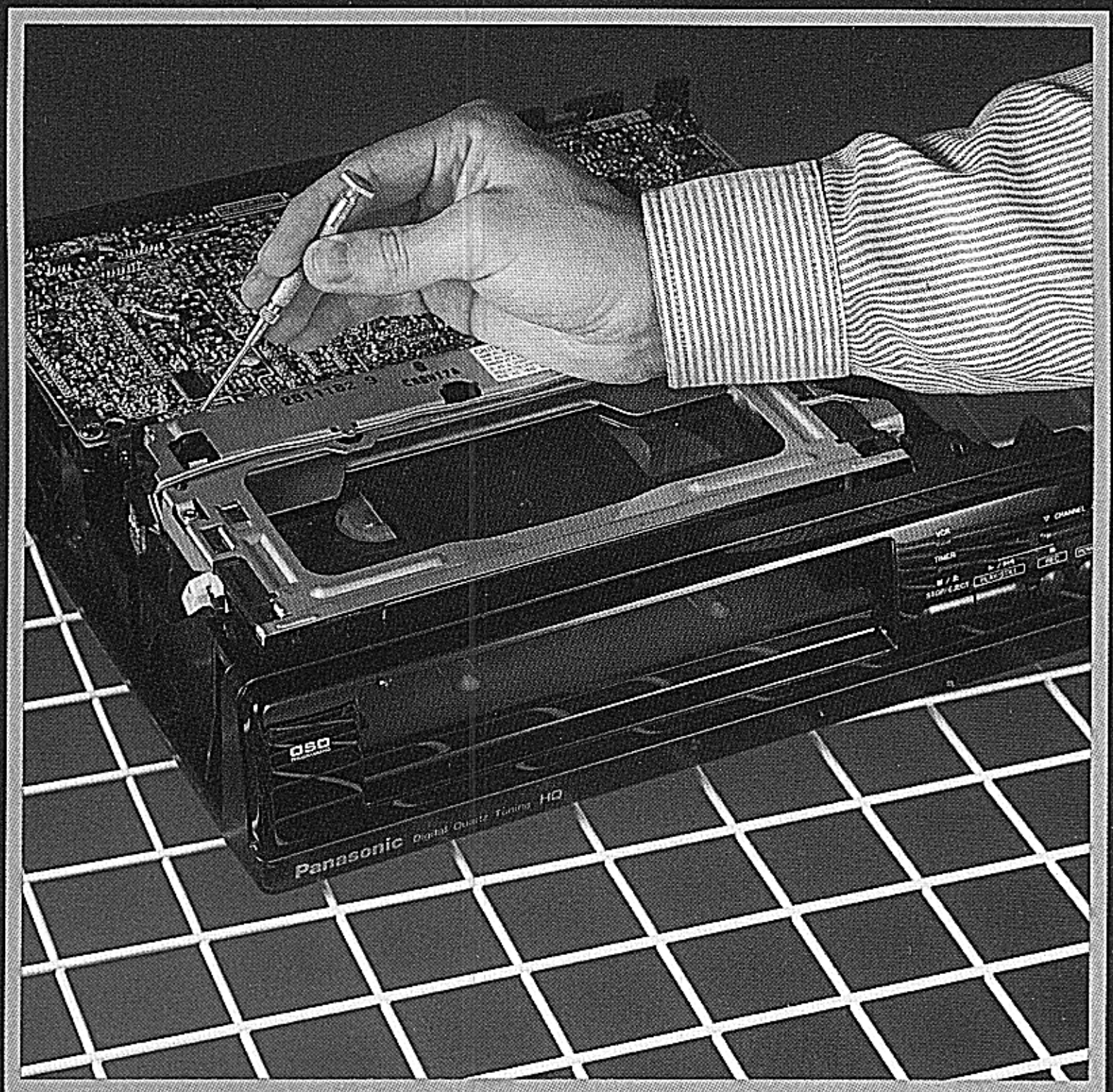
VCR Troubleshooting & Repair

Second Edition



- *Ideal for all VCR owners, hobbyists, & technicians*
- *Step-by-step advice for improved VCR performance*
- *Includes helpful VCR and tape buyer's guide*

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Preface

Seven-fifty for a movie? You've got to be kidding! Not really. Movie theater prices have increased steadily (almost in direct proportion to our kids' allowances). The five-cent Saturday matinee of the late forties has become the four-dollar "flick" of today.

However, an interesting phenomenon is occurring in the movie-watching consumer marketplace. Fewer people attend the expensive premiere showing, where long lines wrap lazily around the theater building. Instead, they prefer the comfort of home or apartment with a video cassette recorder or player, a large-screen television, a rented movie, handy snacks, and drinks.

From the moment the first commercial home video player came on the market, the attendance at movie theaters began a slow, but steady decline. At the same time, the number of users who were purchasing their own VCR machines steadily increased. This increase became a torrent as VCR prices dropped from their original $1200 to less than $300 today. The standard features on machines today, such as wireless remote, multiday and multievent timers, hi-fi stereo, and direct cable capability were either not technically available fifteen years ago, or simply too costly for the home video user.

GROWTH OF THE VCR MARKET

The video recorder market has steadily evolved over the last twenty years and is just now beginning to reach its prime. Today we can display fantastic color films on wide screens and with ear-rumbling sound. Stereo effects that could be experienced only in movie theaters are now possible at home. We can reproduce the same visual and sound effects from a rented copy of *Star Wars* that we saw and felt in the theater as a huge star cruiser roared out of the ceiling

above and onto the screen. Sounds from a half dozen stereo speakers can fill our video world with the powerful engine rumble and action of this amazing space adventure. Today, far more films are seen at home on VCRs than in theaters, and this gap is widening.

In 1980, about 3 percent of U.S. households owned video cassette recorders. In 1990 nearly 50 percent of all U.S. households owned a VCR! (The actual percentage may be less because many people own two.) In number of units this equates to more than 35 million home users in the United States alone. In Europe and Japan, the number of home users is almost as high. A new VCR is being built every second. The number of home VCR owners is growing at an increasing rate.

A spokesman for RCA stated that ". . . households are still without the pleasures of home video, an ever-growing number of consumers are (now) buying their second VCR." Of the nearly 12 million VCRs sold in 1985, two million were second purchases . . . second units or upgraded replacements.

Often an upgraded model can be purchased for less than the cost of an original machine. Users find a second VCR convenient for taping from one set while watching a program on another. A second VCR is also indispensable for editing home videos and making copies of your masterpiece for relatives.

Finally two VCRs let you rent tapes in either VHS or Beta format. However, nine out of 10 VCRs sold today are designed for VHS format tapes, so many movie rental stores have abandoned Beta and are carrying only VHS format tapes.

TROUBLESHOOTING AND REPAIR

Owning a VCR is fun, it's exciting, and it's entertaining. But when the machine begins to act strangely or the picture on your TV starts looking weird, the thrill quickly fades and a form of recreational panic sets in. This stress reaches a peak when the VCR owner sets the machine on the repair center counter and learns there is a sixty-five dollar charge just to open the unit to find the problem.

To make matters worse, the problem can often be traced to operator error or to some simple action that would have restored normal operation. Nowhere is the adage "Read the manual if you want to save time and money" more important and repeatedly confirmed than with the ownership and use of a VCR. Yet the manual is usually the first thing that the owner misplaces or tosses away.

This book has been written to help all the users who either don't understand or can no longer find their operator's manual. It guides both novice and experienced VCR users through the magic of video recording. But more important, it gives valuable insights into those things that you do yourself to restore correct operation or prevent failures from occurring.

OVERVIEW AND CHAPTER ORGANIZATION

This second edition has been revised to include troubleshooting and repair of current video cassette recorders. In addition to older models, it describes mechanical and electrical failures common to current machines, with techniques for determining the likely cause for malfunction. New circuit descriptions address Extended Definition Beta and Super VHS models.

This book is designed to provide information on VCR maintenance regardless of a person's repair experience and understanding of electronic and mechanical principles. The order in which the chapters appear segregates the book in two sections. Chapters 1 through 4 constitute the first section. They provide a general introduction to VCR routine maintenance and repair for both the interested VCR owner and the novice repair person. No basic understanding of electronic theory or VCR operation is assumed. Basic troubleshooting skills are presented, followed by an introduction to VCR troubleshooting and routine maintenance.

The first part concludes with a discussion of typical failures in Chapter 4. The troubleshooting flowcharts in this chapter are designed to aid novice and experienced technicians as well as VCR owners who want to diagnose and repair common failures in their own machines. At the end of each troubleshooting flowchart is a list of possible causes for a malfunction. Some VCR owners may elect to perform troubleshooting techniques learned in the first three chapters and directed by a flowchart.

When finding the failed component requires costly test equipment or a more experienced technician, the troubleshooting flowchart suggests taking your machine to a service center for final repair. Knowing when a repair requires service center action is helpful. By this point, you'll also know the type of repair necessary. This prevents unnecessary expense and faster corrective action.

The second part of this book consists of Chapters 5 through 7. These chapters are provided for those readers serious about understanding VCR operation and electronic troubleshooting. You are assumed to have knowledge of basic electronic theory and troubleshooting. This section guides you through the magnetic and electronic theory associated with VCR circuit operation and introduces you to the various tools and test equipment used by VCR service centers. This information is useful for service technicians new to the trade.

The following describes the contents of each chapter and of the appendix and glossary at the end of this book.

CHAPTER SYNOPSIS

Chapter 1, "Introduction to VCR Maintenance," provides a quick overview of the history of the video machine and describes why VCR maintenance is so important. This preliminary chapter sets the stage for the rest of the book and

shows both the novice and the experienced VCR user how each can gain maximum benefit from the book.

Chapter 2, "Basic Troubleshooting," covers the basic steps in analyzing problems and repairing your own VCR. It describes the troubleshooting process and gives insight into VCR components.

Chapter 3, "Routine Preventive Maintenance," describes in depth the ways you can prevent the breakdown of your machine and preserve precious video tapes.

In Chapter 4, "Specific Troubleshooting & Repair," you will find detailed flowcharts covering most VCR problems. These problems include: a screen that won't display; noise lines dancing across the screen; a VCR that won't record; and a VCR that won't play back.

Chapter 5, "Magnetic Recording Theory," assists those who wish to better understand the principles behind video magnetic recording. This chapter covers video tapes, the process of magnetizing the particles on the tape, and the techniques for playing back and reproducing the video and audio information stored on the tape.

Chapter 6, "VCR Operating Theory," extends the principles of magnetic theory to your video tape recorder. It describes the VCR components and tells how they interact to allow recording and reproducing both audio and video signals from tape. Both Chapters 5 and 6 were included in this book for those who wish more than a novice understanding of the VCR.

In Chapter 7, "Advanced Troubleshooting," you are introduced to the various types of tools and test equipment that become second nature to VCR repair technicians. Servicers of VCRs can use this chapter to familiarize new technicians with the equipment they will be using on the job.

The Appendix provides more meat-and-potatoes information related to the VCR. It covers selection criteria for VCRs and video tapes, a suggested periodic maintenance schedule, and a preventive maintenance checkoff chart. You will also find two comprehensive flowcharts covering the playback and record modes of the VCR.

The Glossary explains over 200 terms and expressions common to video cassette recorder servicing.

VCR Troubleshooting & Repair Guide concludes with a comprehensive index that associates the subjects in this manual to a specific book page.

Gregory Capelo

Robert Brenner

VCR Troubleshooting & Repair

Second Edition

Owning a VCR is fun and entertaining—until something goes wrong. Now, *VCR Troubleshooting & Repair*, Second Edition, is your expert guide to keeping your VCR operating—preventive maintenance!

This practical guide offers a variety of do-it-yourself techniques. So, when your machine acts strange and the picture becomes distorted, you can correctly diagnose the problem, find the cure, and prevent further breakdowns. The book lays out basic troubleshooting guidelines and shows you intelligent ways to preserve your memorable and precious videotapes. VCR and recording principles are also explained so you gain a better understanding of VCR components and recording theory.

Plus, advanced troubleshooting techniques introduce you to more complicated problem-solving—including chassis and mechanical failures. The book covers the latest in stereo audio circuits, Super-VHS, and Extended Definition Beta.

Whatever your needs, *VCR Troubleshooting & Repair*, Second Edition, helps you make your VCR operate smoothly, safely, and properly.

Gregory R. Capelo is the owner of a VCR and VTR repair facility in El Cajon, California. He has serviced broadcast, consumer, and industrial video equipment for more than 14 years. He has taught numerous technical courses to private, government, and industrial technicians on the theory and maintenance of video and television equipment.

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***VCR Troubleshooting & Repair*, Second Edition, gives you insight on:**

- **Basic VCR maintenance**
- **Not-so-complicated VCR repairs**
- **Routine preventive maintenance**
- **Specific troubleshooting techniques**
- **Magnetic recording theory and operation**
- **VCR operating theory and special components**
- **Advanced troubleshooting**

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